

# Report to Scientific Guidance Panel



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**California Department of Public Health  
Environmental Health Laboratory Update**

Oakland, CA  
April 11, 2013

# EHLB Updates

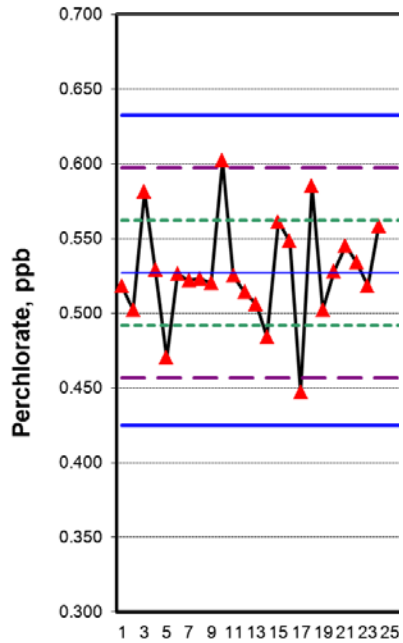
- Methods in production
- Project sample analysis status
- Recent study results
- New method in development
- Future work

# Methods In Production

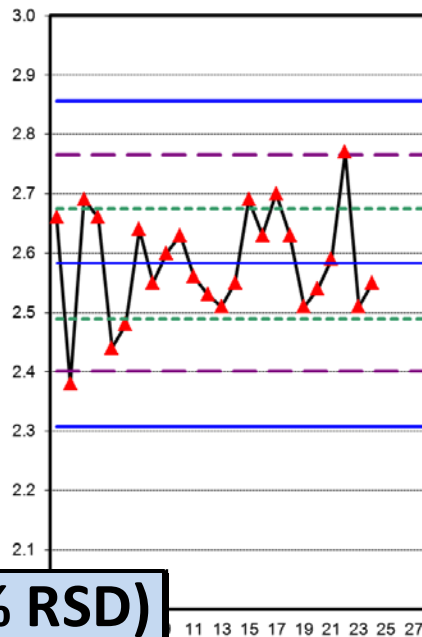
- **Metals in blood** {7}
- **Metals in urine** {12}
- **Creatinine**
- **Phthalate metabolites** {6}
- **DAPs** (dialkyl phosphate metabolites of organophosphorus pesticides) {4}
- **OP specific metabolites, pyrethroids & herbicides** {9}
- **Environmental phenols** {13}
- **OH-PAHs** (polycyclic aromatic hydrocarbon metabolites) {9}
- **Arsenic speciation** {6}
- **NEW!**
- **Perchlorate**

# Perchlorate Validation Quality Control Charts

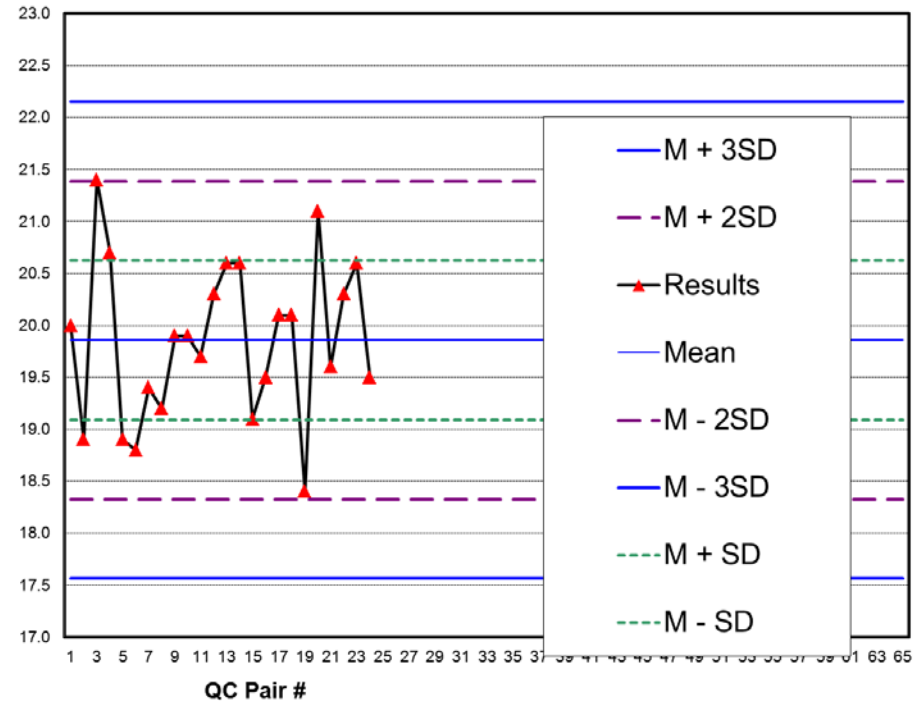
### QC-Low



### QC-Med



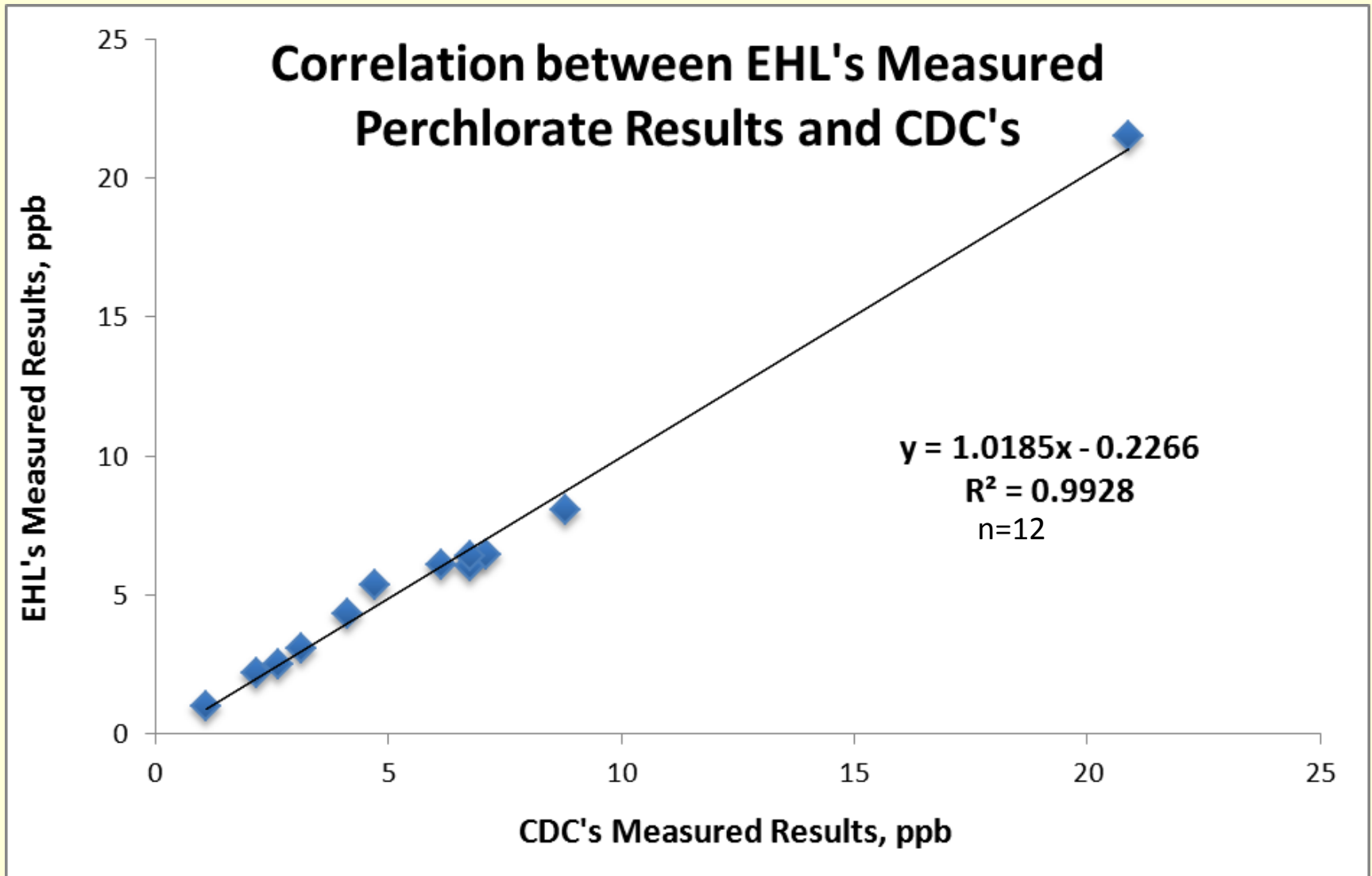
### QC-High



**Precision (% RSD)**  
**n=24**

QC-Low	6.6%
QC-Med	3.5%
QC-High	3.8%

# Perchlorate Method Validation Data

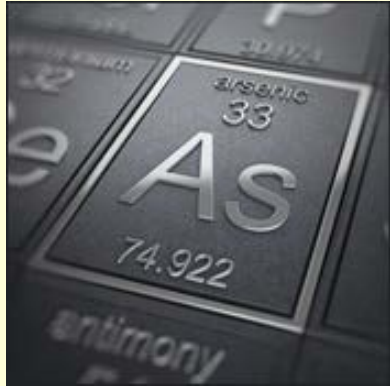


# Project Sample Analyses Status

Methods in Production	MIEEP (blood n=136) (urine n=89)	FOX (blood n=101) (urine n=101)	Pilot BEST (blood n=110) (urine n=109)
Metals in blood	136	101	110
Creatinine	89	101	0
Phthalate metabolites	89	101	0
DAPs	89	dropped	0
OP specific metabolites, pyrethroids & herbicides	89	101	0
Environmental phenols	89	101	0
OH-PAHs	88	101	0
Metals in urine	89	101	0
Arsenic speciation*	13	32	0
Perchlorate	not requested	not requested	60

\*samples are only analyzed if total arsenic levels are  $\geq 20$ ppb

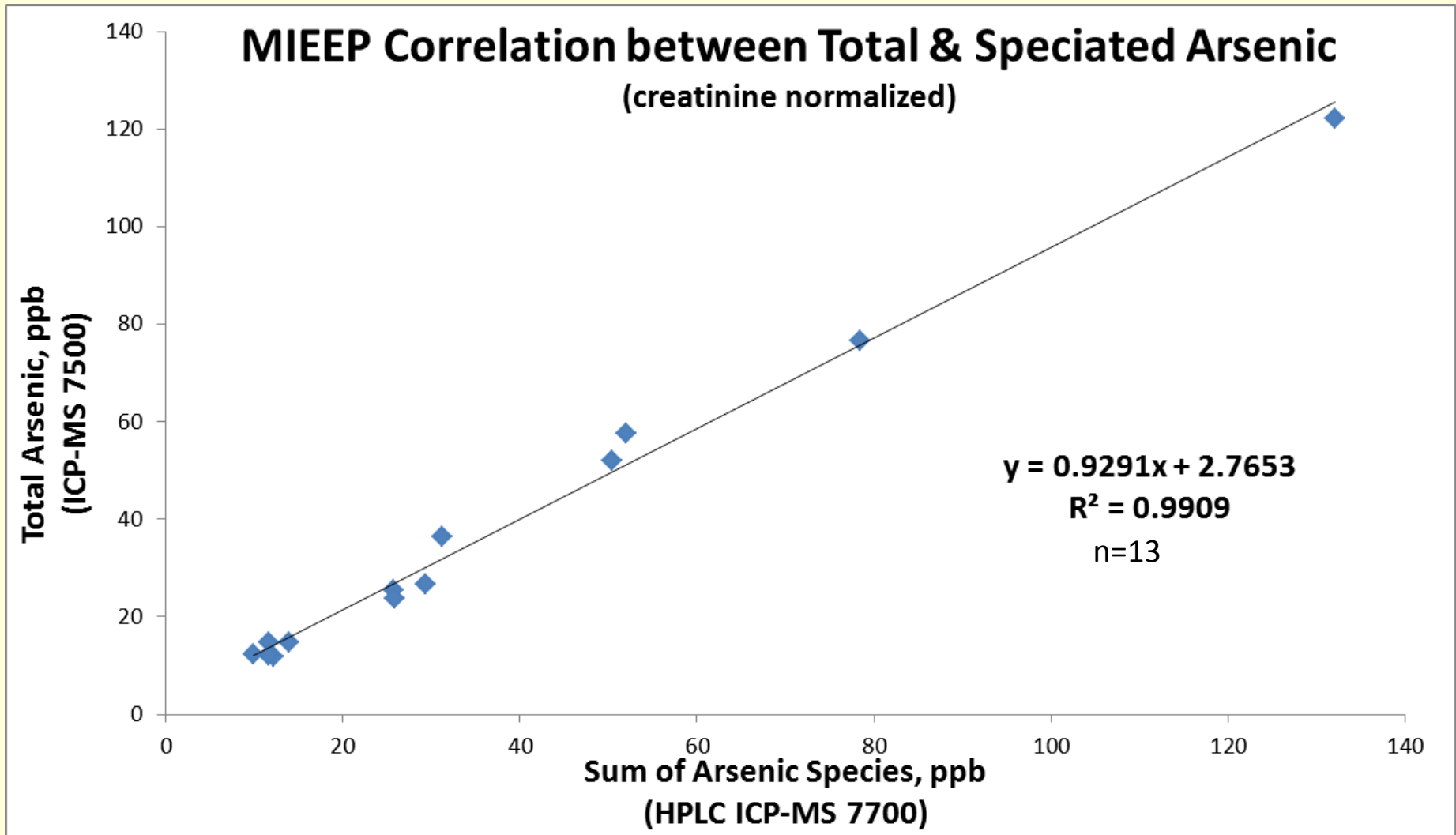
# MIEEP –Speciated Arsenic Overview



Arsenic Species	Abbreviation	Detection Frequency %
Arsenous (III) acid	As-III	53.8
Arsenic (V) acid	As-V	0
Monomethylarsonic acid	MMA	46.2
Dimethylarsinic acid	DMA	100
Arsenobetaine	AsB	100
Arsenocholine	AsC	84.6

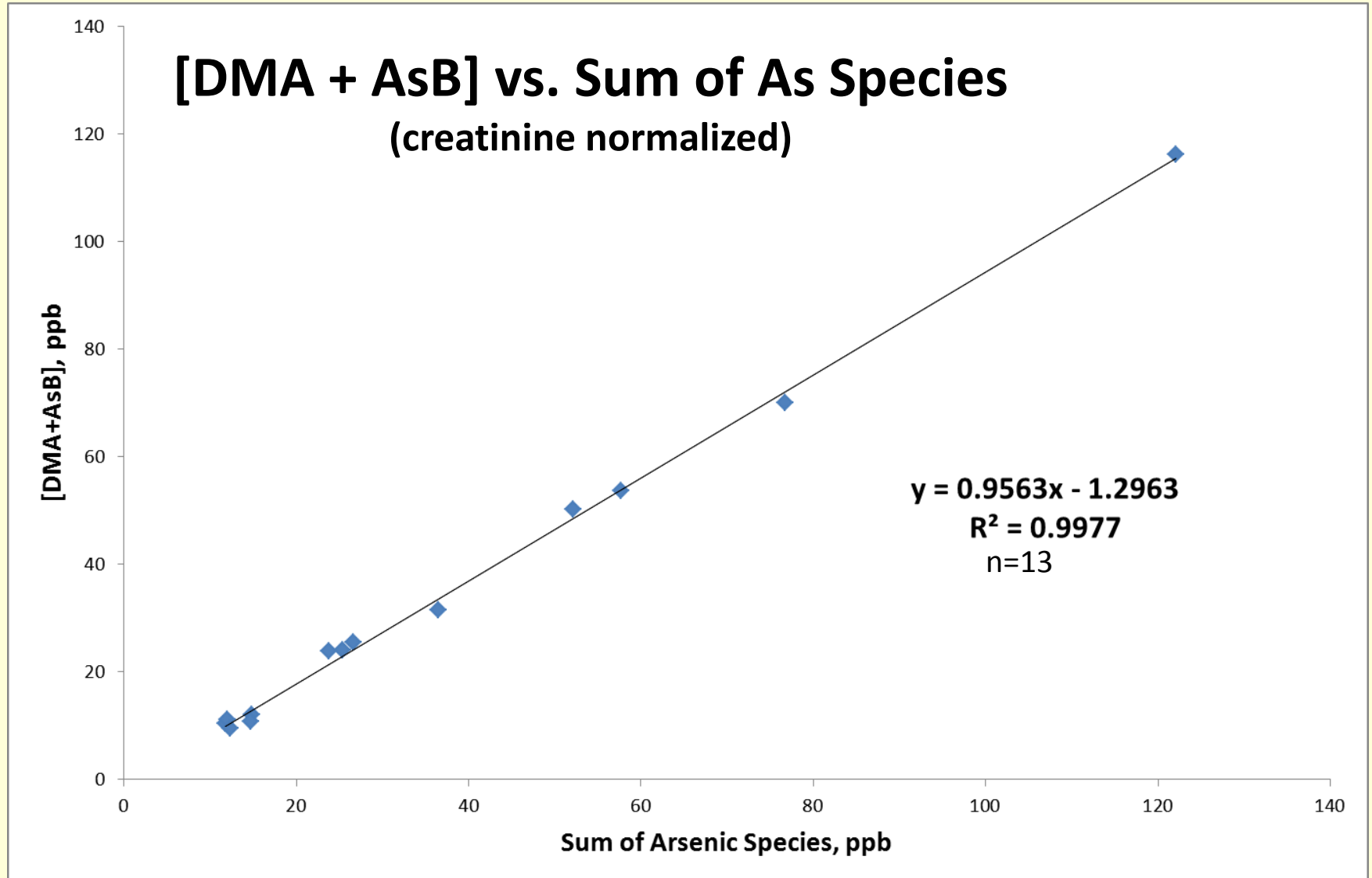
\*Limit of Detection for all listed analytes is 1ppb

# MIEEP – Total & Speciated Arsenic





# MIEEP – Sum of the Dominant Species



# Southern California Firefighters & NHANES: Phthalate Geometric Means Comparison

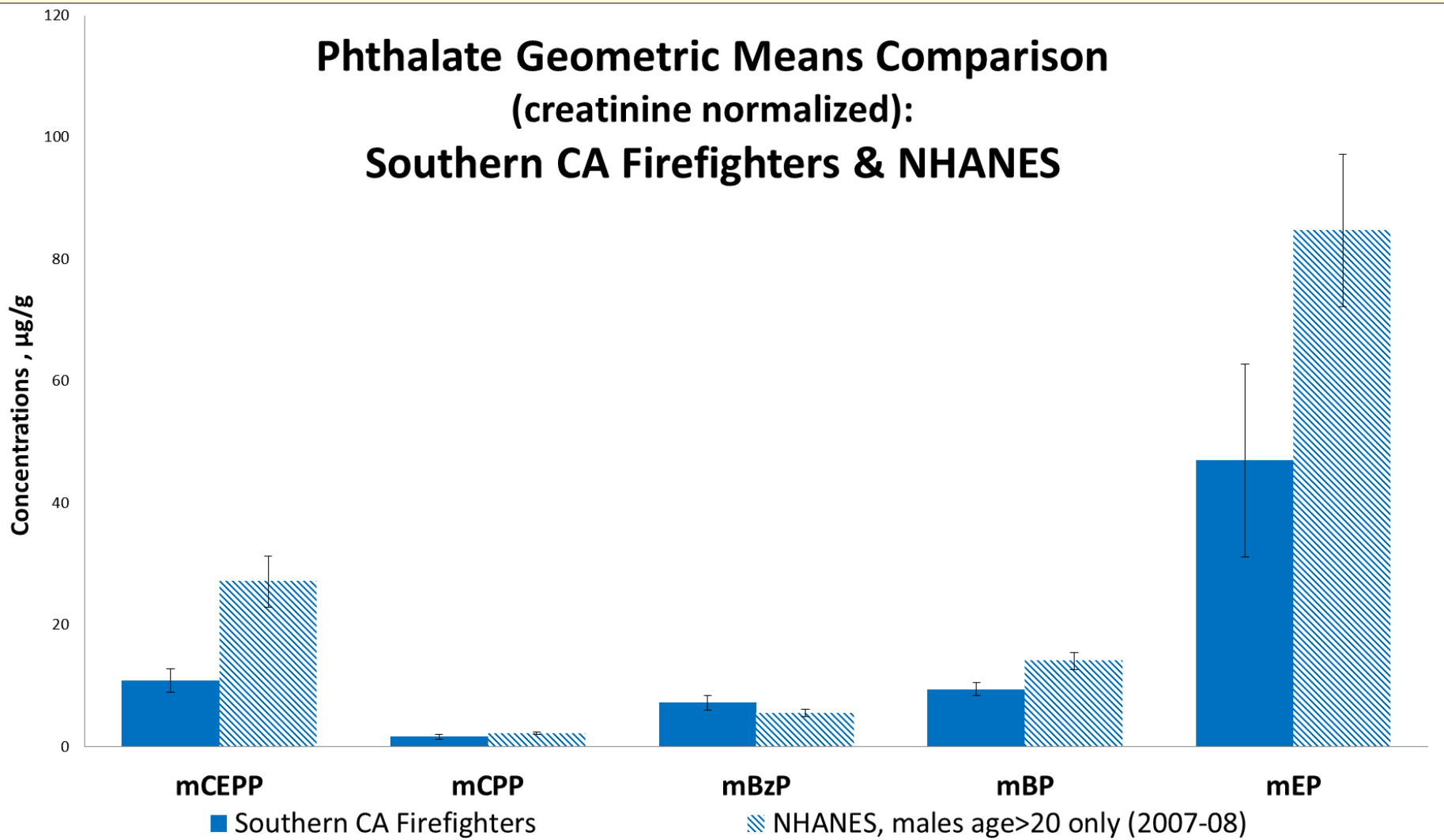
Analyte / Urinary Metabolite	Geometric Mean (95% Confidence Interval), $\mu\text{g/g}$		Detection Frequency %	
	Southern CA Firefighters	NHANES	Southern CA Firefighters	NHANES
mCEPP	<b>10.9</b> (9.38-12.8)	<b>27.2</b> (23.5-31.4)	100	99.8
mCPP	<b>1.67</b> (1.38-2.03)	<b>2.21</b> (2.03-2.42)	98.0	97.9
mBzP	<b>7.27</b> (6.24-8.48)	<b>5.59</b> (5.02-6.21)	100	98.6
mBP	<b>9.46</b> (8.55-10.5)	<b>14.1</b> (12.9-15.5)	97.0	99.1
mEP	<b>47.0</b> (35.2-62.8)	<b>84.8</b> (73.9-97.3)	79.2	100

Southern CA Firefighters (2010-11) n=101

NHANES, adult men age  $\geq 20$  (2007-08) n=885

# Phthalate Geometric Means Comparison

## Phthalate Geometric Means Comparison (creatinine normalized): Southern CA Firefighters & NHANES



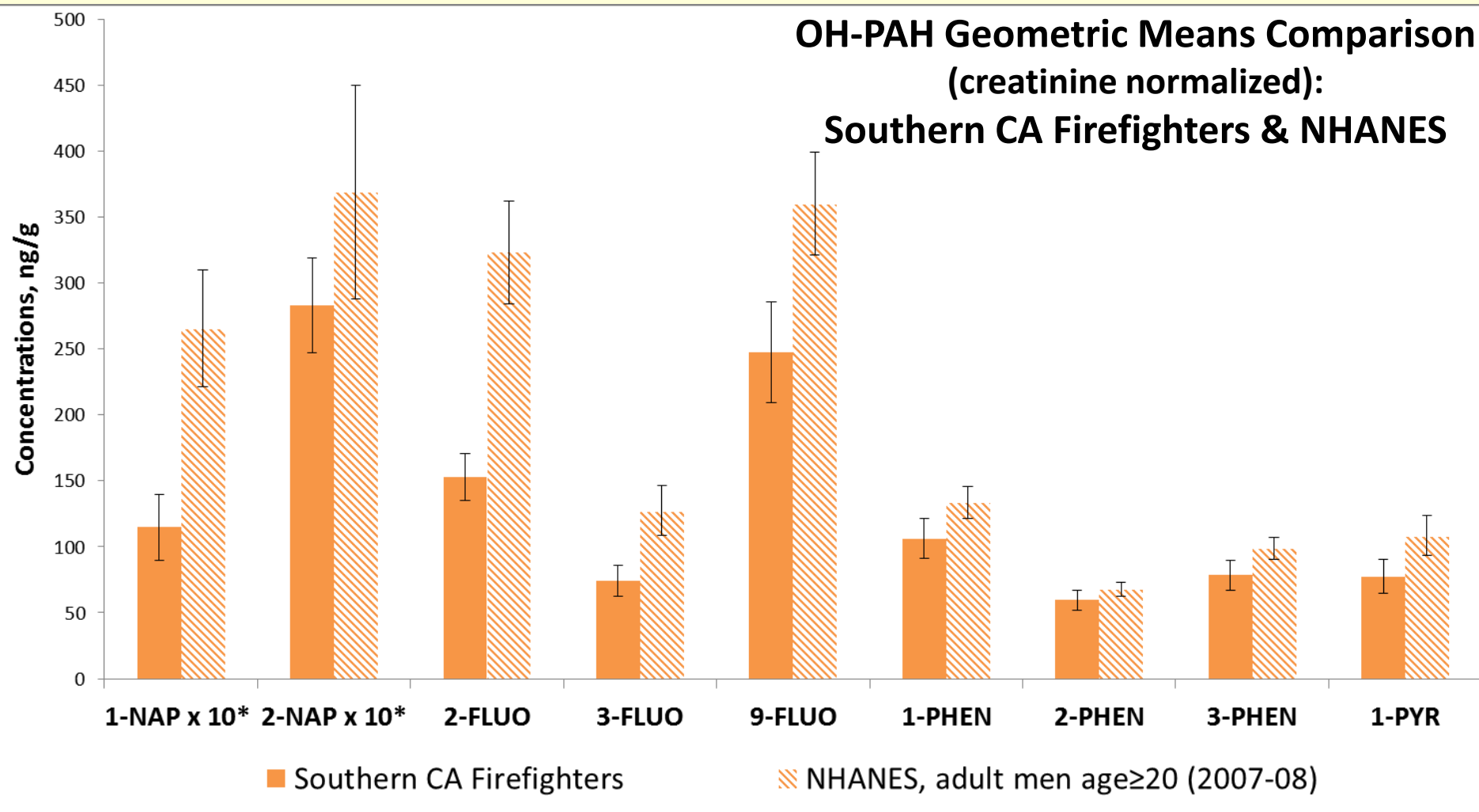
# Southern California Firefighters & NHANES: OH-PAH Geometric Means Comparison

Analyte / Urinary Metabolite	Geometric Mean (95% Confidence Interval), ng/g		Detection Frequency %	
	Southern CA Firefighters	NHANES	Southern CA Firefighters	NHANES
1-NAP	<b>1150</b> (941-1400)	<b>2660</b> (2280-3100)	100	100
2-NAP	<b>2830</b> (2510-3190)	<b>3690</b> (3300-4110)	100	100
2-FLUO	<b>153</b> (137-171)	<b>323</b> (289-362)	100	100
3-FLUO	<b>74.2</b> (63.9-86.2)	<b>127</b> (112-146)	96.0	99.8
9-FLUO	<b>247</b> (215-285)	<b>360</b> (325-399)	100	100
1-PHEN	<b>106</b> (93.2-121)	<b>134</b> (122-146)	100	100
2-PHEN	<b>59.6</b> (53.1-67.0)	<b>67.7</b> (62.9-72.9)	100	99.9
3-PHEN	<b>78.6</b> (68.7-89.9)	<b>98.7</b> (90.7-107)	100	100
1-PYR	<b>77.5</b> (66.7-90.2)	<b>108</b> (95.9-123)	95.1	99.6

Southern CA Firefighters (2010-11) n=101

NHANES, adult men age ≥ 20 (2007-08) n=851-886

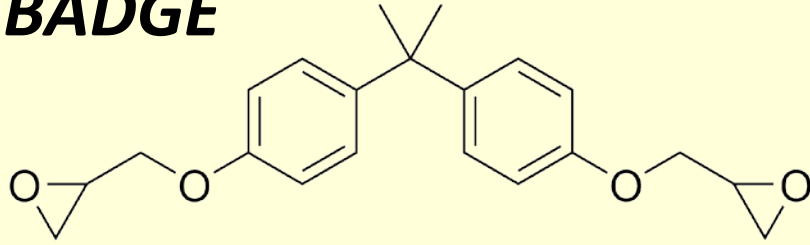
# OH-PAH Geometric Means Comparison



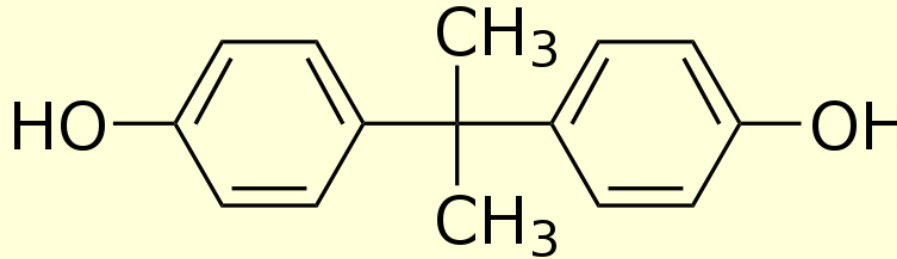
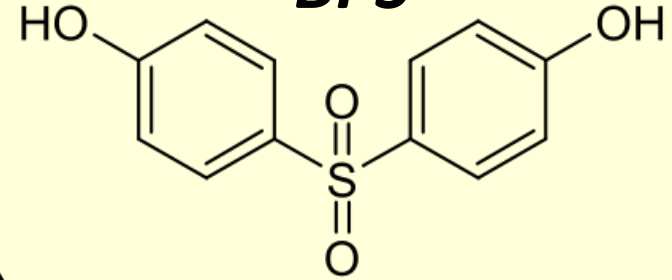
\*OH-PAH values are scaled as indicated

# BPA Analogs and Derivatives

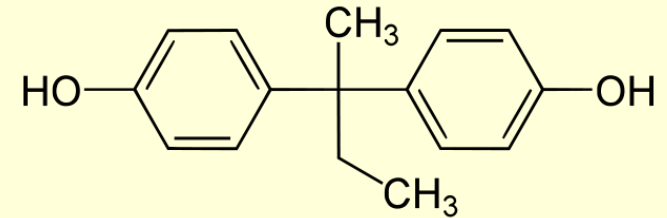
**BADGE**



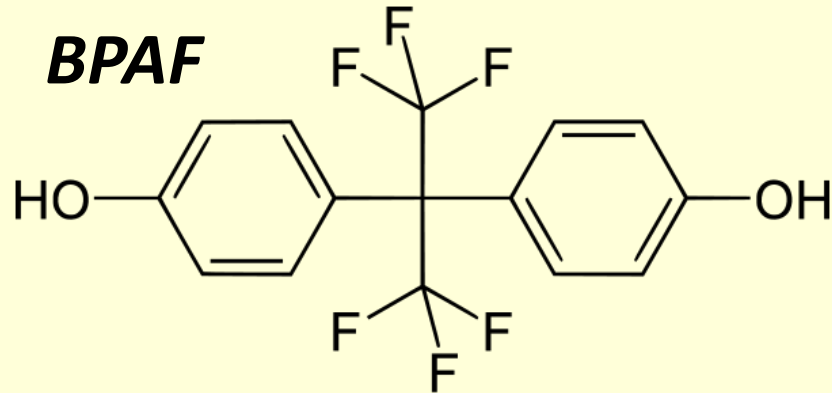
**BPS**



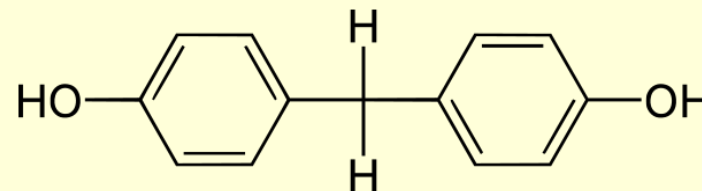
**BPB**



**BPA**



**BPF**



# Future Work

- Continue to develop BPA analogs and derivatives method
- Complete FOX data review
- Analyze Pilot BEST
- Analyze Laboratory Collaboration samples
- Develop & validate automated sample preparation process